Welcome to the West – Where the Landscape is Different from the East

EPA Region 8's Approach to Ecological Assessment

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Ecological Assessment

PROVIDING RELEVANT INFORMATION FOR OPTIMAL ECOSYSTEM STEWARDSHIP

ECOSYSTEMS and HUMANS

- ECOSYSTEMS GOODS AND SERVICES
- ECOSYSTEM CONTRAINTS (NATURAL)

- OPTIMAL ECOSYSTEM USE AND ECOSYSTEM SUSTAINABILITY USE (HUMAN)

- ECOSYSTEM OPPORTUNITIES & REPONSIBILITIES
- ECOSYSTEM STEWARDSHIP

- **NEED FOR COMPREHENSIVE ECOSYSTEM UNDERSTANDING IN ORDER TO PRACTICE ECOSYSTEM MANAGEMENT**

ECOSYSTEMS PROVIDE

THE ESSENTIALS FOR LIFE

THROUGH THEIR UNIQUE COMPOSITION FROM THE

- BIOSPHERE
- GEOSPHERE
- HYDROSPHERE
- ATMOSPHERE

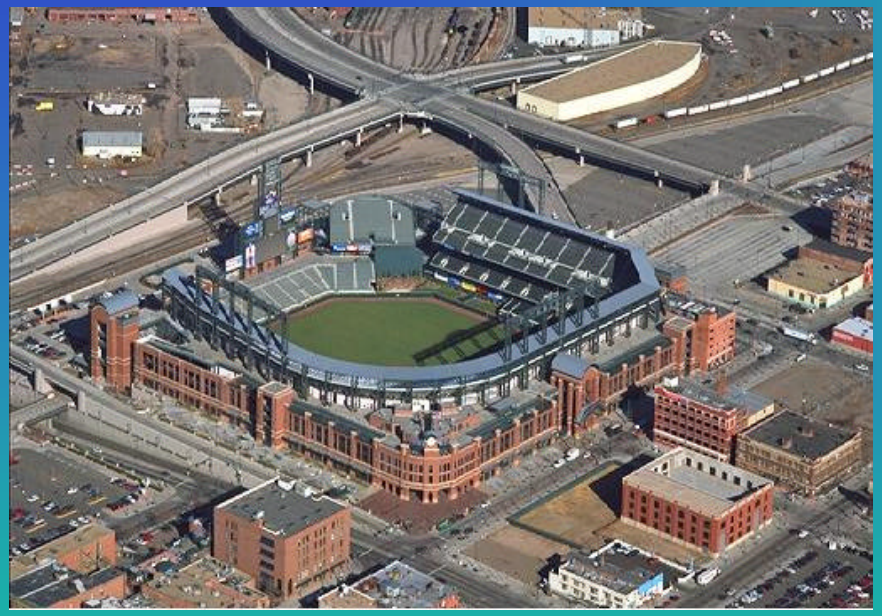
ECOSYSTEMS PROVIDE HABITAT

ECOSYSTEMS PROVIDE FOOD AND FIBER

ECOSYSTEMS PROVIDE NATURAL RESOURCES

ECOSYSTEM USE
- RECREATION (REMOTENESS)

ECOSYSTEM USE
- WHERE WE PLAY, LIVE, AND WORK



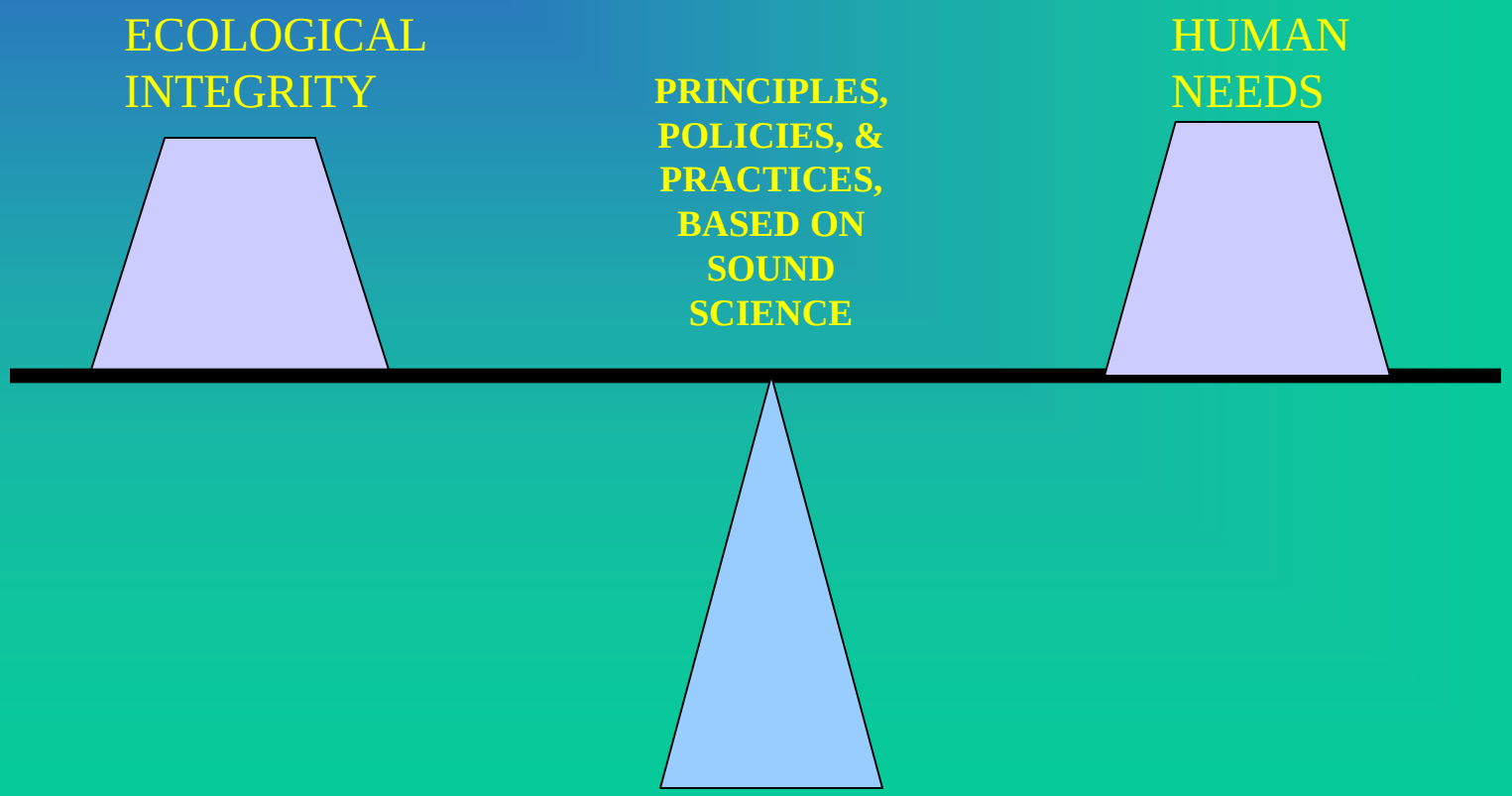
OPTIMAL ECOSYSTEM USE

BALANCE between Natural Processes and Human Needs with respect to competing HUMAN 'VALUES' for:

- ECOSYSTEM FUNCTION
- ECOSYSTEM SUSTAINABILITY

- PROVIDER OF HUMAN NEEDS
  - SHELTER / NUIROUSHMENT
  - ECONOMIC
  - RECREATION
  - RESOURCE NEEDS
    - EXTRACTION (NON RENEWABLE)
    - PRODUCER (RENEWABLE)

ECOSYSTEM SUSTAINABILITY

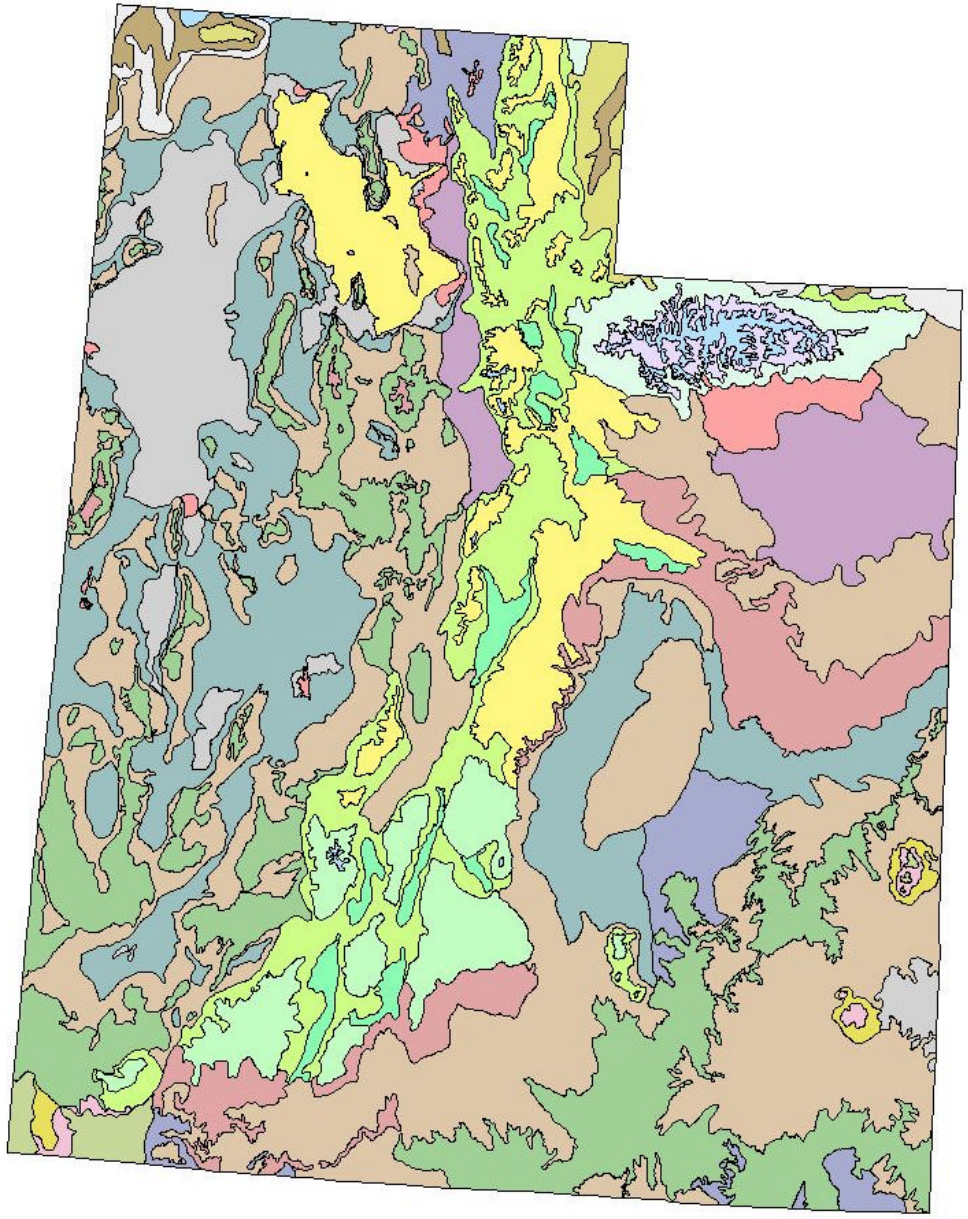


ECOSYSTEM OPPORTUNITIES

The Spectrum of Ecosystem Condition

ECOSYSTEM OPPORTUNITIES

- WHAT DO WE NEED TO UNDERSTAND?
  - ECOSYSTEM FUNCTIONS, USE, AND SENSTIVITIES
  - NATURAL PROCESSES AND ANTHROPOGENIC STRESSORS
- HOW CAN WE ACHIEVE OPTIMAL USE?
  - PRESERVATION
  - RESTORATION
  - EFFECTIVE STEWARDSHIP
    - RESOURCE MANAGEMENT
  - OPTIMAL ECOSYSTEM UTILIZATION
    - PRODUCTIVE USE WITHOUT EXCESSIVE INSULTS
  - MANAGEMENT FOR SUSTAINABILITY
    - APPROPRIATE LEVEL OF RESOURCE CONSUMPTION



DEFINING ECOSYSTEMS

Omernik's Level IV Ecoregions for Utah

One Version of Assessment Units for Ecological Assessment

ECOSYSTEM RESPONSIBILTIES

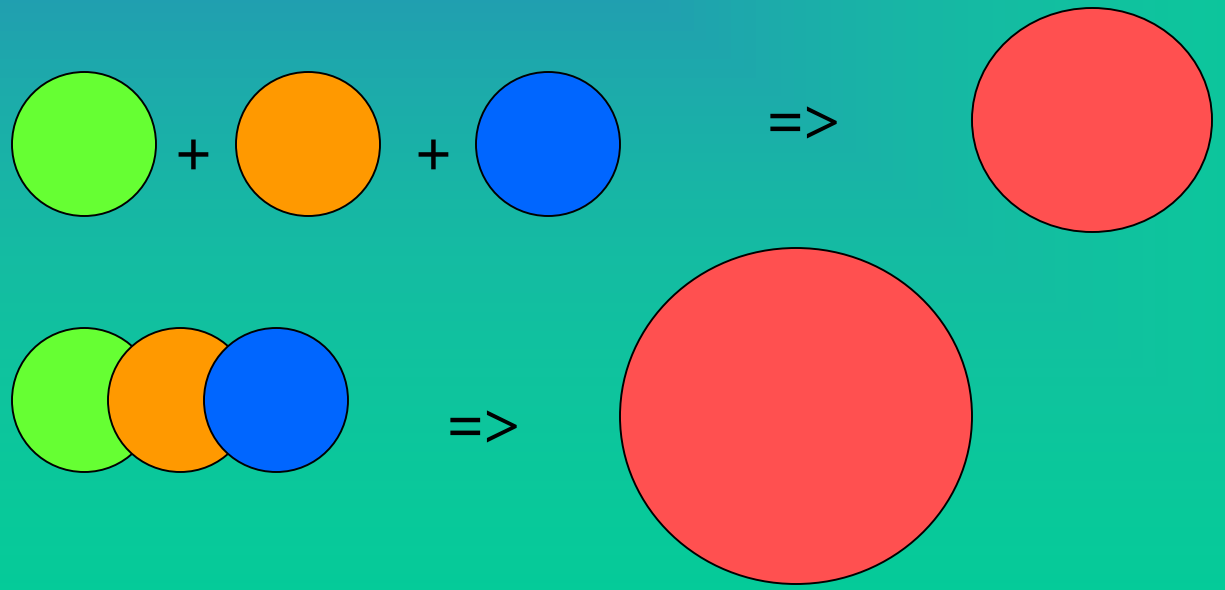
- ECOSYSTEM ALTERATION
  - OPTIMAL LAND USE CHANGE
  - OPTIMAL CROSS ECOSYSTEM MANANAGEMENT
    - BALANCE OF ECOSYSTEM **IMPORTS / EXPORTS**
    - ARTIFICAL LIFE SUPPORT VS NATURAL INTEGRITY
- EXAMPLE: HYDRO MODIFICATION
  - TRANS BASIN DIVERSIONS TO AUGMENT WATER SUPPLY
    - Denver Utilizes Western Slope Water Resources
    - Central Arizona Project (CAP)
    - Central Utah Project (CUP)
- EXAMPLE: AIR TRANSPORT
  - EXTERNAL INDUSTRY => CP REGIONAL HAZE

ECOSYSTEM RESPONSIBILTIES

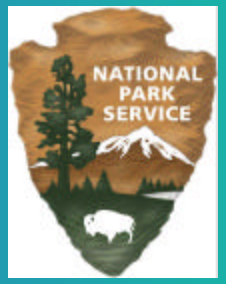
- ECOSYSTEM STEWARDSHIP
  - WHO'S RESPONSIBLE?
  - CAN ANYONE (ANY ONE GROUP) DO IT ALONE?
  - THE WORK IS IN ALL AREAS OF THE ECOSYSTEM CONDITION SPECTRUM (NOT AT JUST ONE END)
- THE ULTIMATE MISSION IS BIGGER THAN ANY SINGLE EFFORT CAN ACHIEVE

BENEFITS OF COOPERATION

- AN INTEGRATED PRODUCT OF ALL EFFORTS IS MORE THAN THE SUM OF INDEPENDENT / INDIVIDUAL EFFORTS
  - EXPERTISE RESIDES IN MANY DIFFERENT PLACES
  - MINIMIZE DUPLICATION, ...



Partnerships
Colorado Plateau Example



EPA Region 8's Ecological Assessment Framework

Guiding Principles

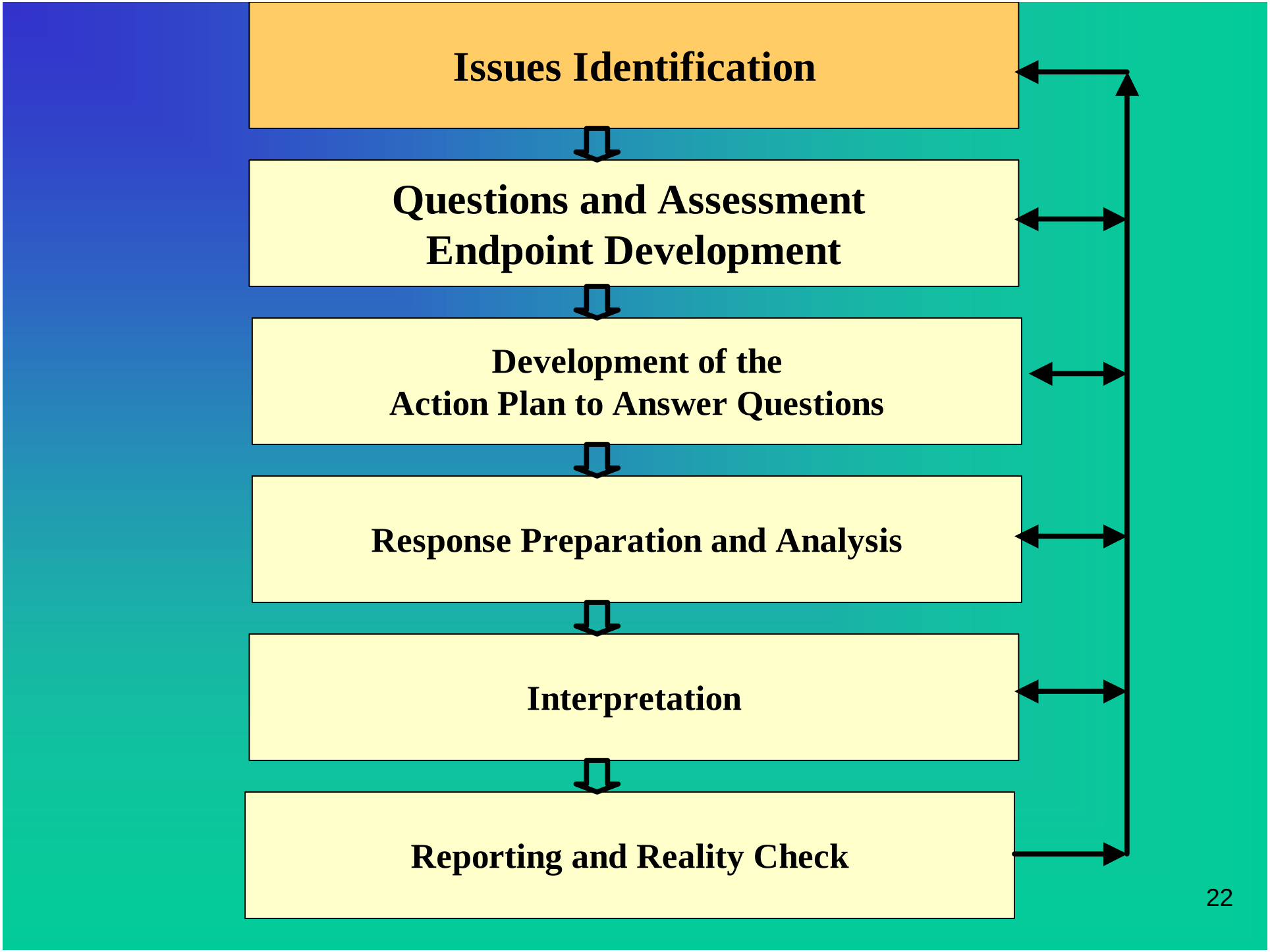
- Ecosystem Approach
  - Scale Hierarchy (Spatial, Temporal, and Thematic)
- Issues-based (identifying conflicts of values)
- Management driven
- Incorporates Sound Science
- Stakeholder Involvement / Partnership
- Open process
- Relevant to EPA Business

Goals of Region 8 Ecological Assessment Efforts

To Define and Answer Relevant Questions About Ecological Condition, Status, and Trends

To Provide Meaningful Information about an Issue or Issues of Management/Stakeholder Concern

- Critical to the Success of the Assessment is the Development of Appropriate Questions and Assessment Endpoints that are Responsive to Addressing the Issue(s)


Issues Identification
Questions and Assessment Endpoint Development
Development of the Action Plan to Answer Questions
Response Preparation and Analysis
Interpretation
Reporting and Reality Check

Issues Identification

- Management Objective(s)
- Multiple Values Considered
- Science Input
- Stakeholder Identification and Input
  - EPA Programs, Fed, State, Tribal, NGOs, public, industry, …
- Other Inputs
  - a priori knowledge
  - expert opinion and insight
- Ideally: An Open Workshop Forum

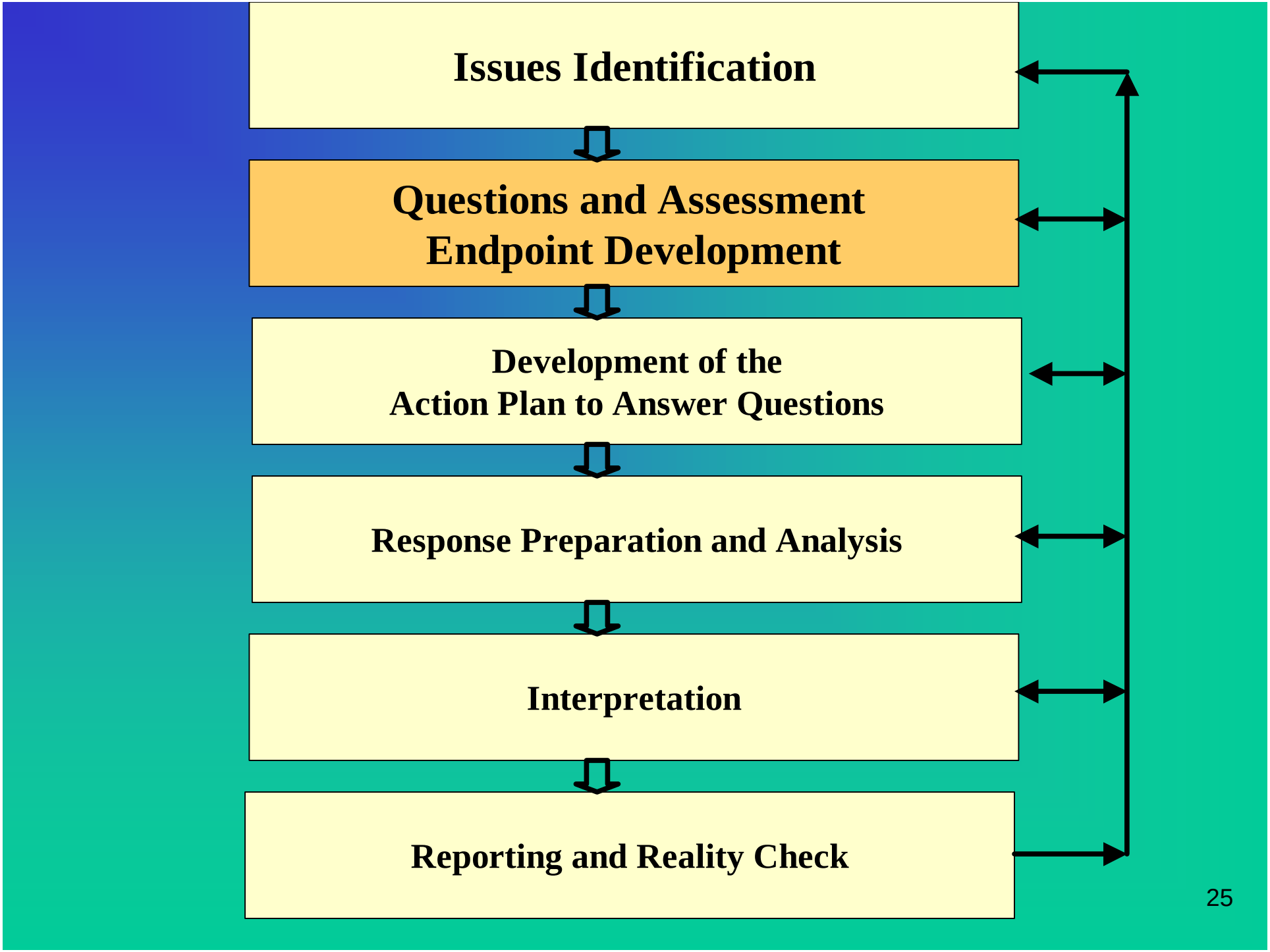
Issues Identification – Colorado Plateau Examples

Identification Techniques

- List Compilation (Ongoing)
- Workshops – lists and rankings
- Partnership Brainstorming
- Expert Opinions / Insights

Some Key Issues for EPA Involvement

- Uranium
- Riparian Habitat
- Habitat Fragmentation
- Oil and Gas Development
- Water Quantity and Quality
- Air Quality – Regional Haze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Questions and Assessment Endpoints Development

- Issues-based Questions
- Question development team
  - Engage stakeholders
- Spend adequate time on this
  - Critical Step of the Assessment Process
- Do the reality check of ‘So What’, if given an answer to the proposed question
- Gain ‘buy in’ for the question set
- Indicators and Indices (weights)

Questions and Assessment Endpoints Development (continued)

Separate Assessment and Research Agendas

- Assessment Endpoints defined and directly relevant to the questions

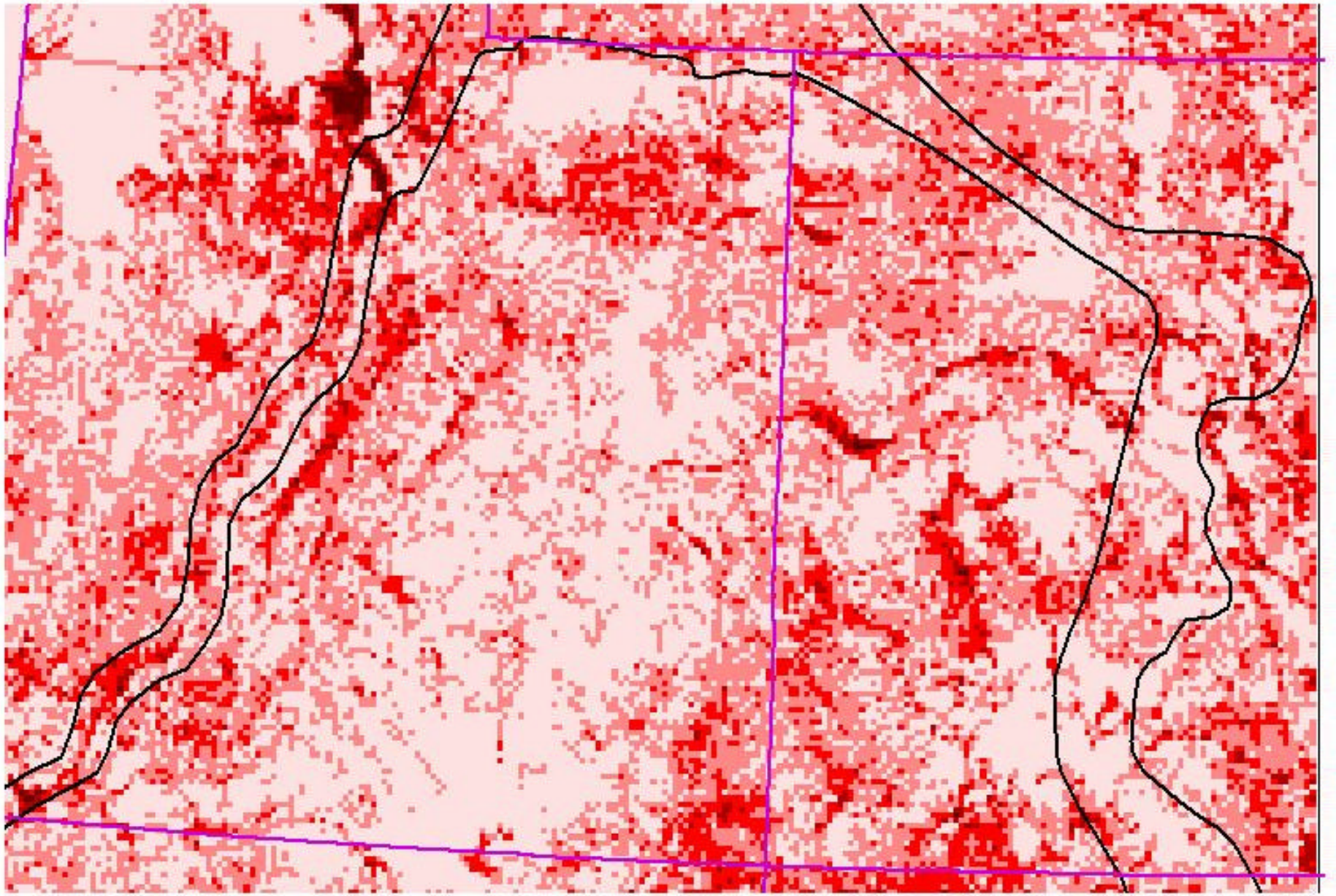
  (Indicators and Indices focus)

  - Information to Support Answers
  - Ability to work with an Assessment Continuum
    - Tools for Reassessment / Adaptive Management and Measuring Performance

Questions and Assessment Endpoints Development - Colorado Plateau Examples (Efforts Involving EPA)

- What is the Ecological Condition, Status, and Trend; What are the Stressors, etc.
  - Riparian Habitat Condition
    - Invasive Species (i.e. Salt Cedar – extent and impact)
    - Grazing Impacts (Cattle density)
  - Habitat Fragmentation (road density, dist. from roads)
  - Water Quality and Quantity
  - Oil and Gas Development
    - Where and How Much (resource extent & well density)
    - Where will it most likely occur in the future
  - Uranium (AML density, proximity to water)
  - Air Quality - Regional Haze – Sources / Visibility

Indicator Example for the Colorado Plateau (UT and CO portion)
Road Density (km / sq km) – Addressing Habitat Fragmentation



Never underestimate the value of going to the field – If a picture is worth a thousand words, then a field visit is worth a million (trillion?)